

## Flora of Bokor National Park, Cambodia II: Four New Species and Nine New Records of *Lasianthus* (Rubiaceae) from Cambodia

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Twenty four species of *Lasianthus* are documented from Bokor National Park, Kampot Province, Cambodia. Four new species, *Lasianthus bokorensis*, *L. giganteus*, *L. oblanceolatus*, and *L. stephanocalycinus*, are described based on newly collected materials. Nine species, *L. austrosinensis*, *L. biflorus*, *L. chevalieri*, *L. clementis*, *L. curtisii*, *L. hispidulus*, *L. latifolius*, *L. sarmentosus*, and *L. viridiramulis*, are newly recorded from Cambodia. *Lasianthus viridiramulis* is proposed as a replacement name for *Lasianthus brevipes* Craib non Valetton.

**Kew Words:** Bokor National Park, Cambodia, *Lasianthus*, new records, new species, Rubiaceae

*Lasianthus* Jack (Rubiaceae) comprises more than 180 species, most of which are understory shrubs of primary forests (Zhu *et al.* 2012). Although the genus is pantropical, some 160 species occur in tropical Asia with one species extending into Australia (Zhu *et al.* 2012) and three species in warm temperate regions of Japan, the northern limit of the genus (Yamazaki 1993). Twenty three species are in Africa (Jannerup 2006), and three species are known from New World (Urban 1899, Robbrecht 1982, Zanoi 1989). Whereas some species are quite widely distributed in Asia, at least 69 taxa are local endemics. In Borneo and Peninsular Malaysia, 32 of 71 and 18 of 54 taxa, respectively, are endemic (Zhu *et al.* 2012). *Lasianthus* could be interesting for the study of speciation

and biogeography in Southeast Asia.

Within the Asian regions, recent taxonomic revisions have been published for Thailand (57 species, Zhu 2001a, Zhu 2002b), China (33 species, Zhu 2002a, Zhu & Taylor 2011), and the Malesian region (131 species, Zhu *et al.* 2012). Preliminary taxonomic treatments have been published for Cambodia (Dy Phon 2000) and Vietnam (Hô 2000), and new species have been described from Vietnam (Zhu & Roos 2002) and India (Karthigeyan *et al.* 2011, Kumar *et al.* 2014). Despite these publications, taxonomic studies of *Lasianthus* in Asia are still required.

Pitard (1922–1924) documented 37 species of *Lasianthus* from the French Indochina region, with nine of them from Cambodia. Since then

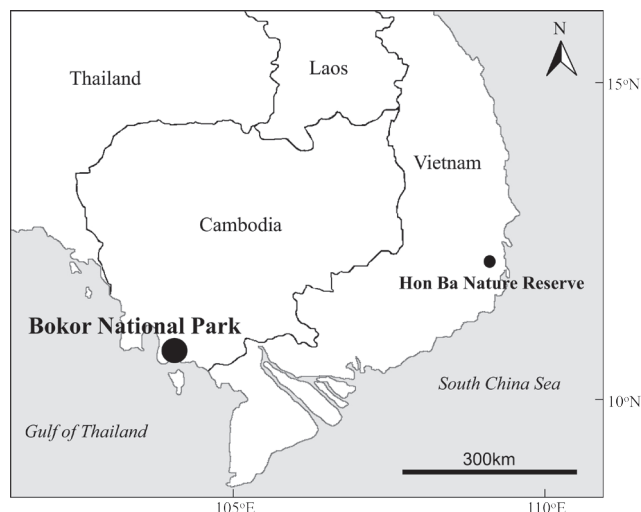


FIG. 1. Location of Bokor National Park, Cambodia, and Hon Ba Nature Reserve, Vietnam.

further taxonomic studies were interrupted by civil conflicts in the latter part of the 20th century (Davis *et al.* 2009). Following that chaotic period, fieldwork and taxonomic studies of the plants of Cambodia have been reactivated. Several publications of new records and new species from Cambodia (e.g. Sridith & Larsen 2003, Tagane *et al.* 2015) suggest that additional species of *Lasianthus* can be expected to be found.

A floristic survey to assess plant diversity was conducted in southern Bokor National Park, Kampot Province, southern Cambodia, from December 2011 to December 2013 (Fig. 1, see Tagane *et al.* 2015, for more detail). Bokor National Park covers 1,400 km<sup>2</sup>, and includes a sandstone plateau known as the Elephant Mountains, which rise sharply from sea level to an elevation of 1,079 m (Rundel *et al.* 2003). The steep south-facing slopes and geographical proximity to the sea bring the Bokor mountain area more than 5,000 mm of annual precipitation. The area is known as one of the most humid places on the Indochina peninsula (Tixier 1979). Supported by the abundant rainfall, evergreen forests extend the Bokor mountain area (see Tagane *et al.* 2015, for more detail). High diversity in plant species, especially in *Lasianthus*, was observed during our botanical inventories in the region. Here, 24 species of *Lasianthus*, including four new and

nine newly recorded species in Cambodia, including all the nine species previously reported from Cambodia (Pitard 1922–1924), are listed and described. Of the four new species, three are currently known only from Bokor National Park; *Lasianthus stephanocalycinus* is known only from Bokor National Park and Hon Ba Nature Reserve, Khanh Hoa, southern Vietnam (Fig. 1).

The flowers of *Lasianthus* are not useful diagnostically because they are lacking in many herbarium specimens (Zhu *et al.* 2012). In the present study, we identified and described the species of *Lasianthus* in Bokor National Park using mainly vegetative characters, such as the shape and indumenta of the twigs, leaves, and stipules. The shape of the calyx is also used. Two species, comprising only three specimens, could not be identified.

Voucher specimens were deposited in the Forest Administration of Cambodia (here abbreviated as Cam) and the Herbarium of the Museum of Kyushu University (FU), Fukuoka, Japan. Some specimens were also deposited in the Herbarium of the Kyoto University Museum (KYO), Kyoto, Japan, the Forest Herbarium (BKF), Bangkok, Thailand, the Royal Botanic Garden Kew (K), London, UK, and the Muséum National d'Histoire Naturelle (P), Paris, France.

Key to the species of *Lasianthus* in Bokor National Park

- 1a. Twigs glabrous or glabrescent ..... 2
- 1b. Twigs hairy ..... 6
- 2a. Leaves sessile; blade (14.5–)17–23 cm long, secondary veins more than 15 pairs .. 5. *L. cambodianus*
- 2b. Leaves petiolate; blade less than 18 cm long, secondary veins less than 11 pairs ..... 3
- 3a. Secondary veins looped ..... 22. *L. viridiramulis*
- 3b. Secondary veins curved to the margin, not looped ..... 4
- 4a. Apex of stipules round; tertiary leaf veins reticulate, inconspicuous when dry ..... 18. *L. repoeuensis*
- 4b. Apex of stipules acute to acuminate; tertiary leaf veins parallel, conspicuous when dry ..... 5
- 5a. Petioles 1–1.5 cm long; leaf blade 5–7 cm wide ..... 16. *L. latifolius*
- 5b. Petioles 0.5–1 cm long; leaf blades 2–4.5 cm wide ..... 15. *L. inodorus*
- 6a. Leaf blade more than 20 cm long ..... 12. *L. giganteus*
- 6b. Leaf blade less than 20 cm long ..... 7
- 7a. Base of leaf blade cordate ..... 1. *L. attenuatus*
- 7b. Base of leaf blade cuneate ..... 8
- 8a. Leaf blade less than 3.5 cm long ..... 3. *L. biflorus*
- 8b. Leaf blade more than 3.5 cm long ..... 9
- 9a. Twigs and petioles villous or hirsute ..... 10
- 9b. Twigs and petioles neither villous nor hirsute, trichomes appressed ..... 15
- 10a. Bracts conspicuous ..... 13. *L. hirsutus*
- 10b. Bracts inconspicuous or absent ..... 11
- 11a. Midrib of leaves pubescent on both surfaces ..... 6. *L. chevalieri*
- 11b. Midrib of leaves pubescent only on abaxial surface ..... 12
- 12a. Tertiary leaf veins densely parallel ..... 13
- 12b. Tertiary leaf veins reticulate ..... 14
- 13a. Hairs on twigs more than 0.5 mm long ..... 20. *L. stephanocalycinus*
- 13b. Hairs on twigs less than 0.5 mm long ..... 24. *L. sp. 2*
- 14a. Calyx lobes longer than calyx tube ..... 10. *L. curtisii*
- 14b. Calyx lobes shorter than calyx tube ..... 14. *L. hispidulus*
- 15a. Stipules oblong to oblong-triangular ..... 8. *L. chrysoneurus*
- 15b. Stipules triangular ..... 16
- 16a. Leaf blade chartaceous ..... 17
- 16b. Leaf blade coriaceous to subcoriaceous ..... 18
- 17a. Leaf blade elliptic to oblanceolate; petiole 7–10 mm long ..... 17. *L. oblanceolatus*
- 17b. Leaf blade elliptic; petiole 1–2 mm long ..... 19. *L. sarmentosus*
- 18a. Secondary veins 10–12 pairs; leaf blade more than 14 cm long ..... 7. *L. chinensis*
- 18b. Secondary veins less than 10 pairs; leaf blade less than 14 cm long ..... 19
- 19a. Secondary veins 8 or 9 pairs ..... 21. *L. verticillatus*
- 19b. Secondary veins less than 8 pairs ..... 20
- 20a. Midrib near base (1/3–1/4) of leaf pubescent adaxially ..... 23. *L. sp. 1*
- 20b. Midrib of leaf completely glabrous adaxially ..... 21
- 21a. Calyx lobes elliptic to oblanceolate ..... 2. *L. austrosinensis*
- 21b. Calyx lobes triangular ..... 22
- 22a. Calyx lobes longer than calyx tube ..... 4. *L. bokorensis*
- 22b. Calyx lobes shorter than calyx tube ..... 23
- 23a. Leaves darkish green adaxially when fresh; calyx densely strigillose ..... 9. *L. clementis*
- 23b. Leaves green adaxially when fresh; calyx sparsely pubescent ..... 11. *L. fordii*

## Species of *Lasianthus* in Bokor National Park

**1. *Lasianthus attenuatus*** Jack, Trans. Linn. Soc. London 14 (1): 126 (1823).

var. ***attenuatus*** —Fig. 2A.

H. Zhu & C. M. Taylor, Fl. China 19: 185 (2011); H. Zhu *et al.*, Blumea 57: 13 (2012).

*Lasianthus wallichii* Wight, Calcutta J. Nat. Hist. 6: 503 (1846); Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 378 (1924); P. H. Hô, Ill. Fl. Vietnam 3: 209, fig. 8538 (2000); H. Zhu, Acta Phytotax. Sin. 39: 146 (2001a).

*Lasianthus plagiophyllus* Hance, J. Bot. 13: 196 (1875).

*Lasianthus bordenii* Elmer ex Merr., Philipp. J. Sci. 1 (Suppl.): 135 (1906).

*Lasianthus thorelii* Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 389 (1924).

*Lasianthus setosus* Craib, Bull. Misc. Inform. Kew 1933: 26 (1933).

*Mephitidia tonkinensis* Drake, J. Bot. (Morot) 9: 240 (1895).

*Nonatelia hispida* Wall., Fl. Ind. 2: 187 (1824).

*Specimen examined.* CAMBODIA. Bokor National Park, alt. 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, Toyama *et al.* 3137 (Cam, FU, KYO).

*Distribution.* Bhutan, Brunei, Cambodia, China, Indonesia, Japan, Laos, Malaysia, Myanmar, Nepal, Papua New Guinea, Philippines, Taiwan, Thailand, Vietnam.

**2. *Lasianthus austrosinensis*** H. S. Lo, Bot. J. S. China 2: 4 (1993); H. Zhu & C. M. Taylor, Fl. China 19: 188 (2011). —Fig. 2B.

*Specimen examined.* CAMBODIA. Bokor National Park, alt. 970 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, Toyama *et al.* 3096 (Cam, FU).

*Distribution.* Cambodia (new record), China.

*Note.* *Lasianthus austrosinensis* is similar to *L. fordii* in having elliptic leaves, but different in having oblong to elliptic or oblanceolate calyx

lobes.

**3. *Lasianthus biflorus*** (Blume) M. Gangop. & Chakrab., J. Econ. Taxon. Bot. 16: 338 (1992); H. Zhu & C. M. Taylor, Fl. China 19: 189 (2011); H. Zhu *et al.*, Blumea 57: 19 (2012). —Fig. 2C.

*Litosanthes biflora* Blume, Cat. Gew. Buitenzorg (Blume): 22. (1823).

*Lasianthus gracilis* King & Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 73: 132 (1904).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, Toyama *et al.* 3146 (Cam, FU); in the same location, May 2012, Toyama *et al.* 3173 [fl. bud] (Cam, FU, K, KYO).

*Distribution.* Cambodia (new record), China, Indonesia, Malaysia, Philippines, Thailand, Vietnam.

*Note.* Only one small population of *Lasianthus biflorus*, a shrub, 1–2 m tall in a moist evergreen forest near Popokvil waterfall, is known.

**4. *Lasianthus bokorensis*** Naiki, *sp. nov.* —Figs. 2D–G & Fig. 3.

Similar to *L. fordii* in the strigillose twigs and elliptic leaves, but different in having narrower leaves, 9–13 × 2.5–4.5 cm, and much longer calyx lobes, 3–4.5 mm long. Mature fruit color is orange in *L. bokorensis*, but blue in *L. fordii*.

*Typus.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E, in moist evergreen forest, 9 Dec. 2011, Toyama H., Tagane S., Ide T., Chhang P., Nagamasu H., Yahara T. 1842 (holotype–KYO; isotypes–Cam, K).

*Description.* Shrubs, evergreen, 1–1.5 m tall; twigs terete, ca. 2 mm in diam., densely strigillose. Leaves opposite; petiole 6–9 mm long, densely strigose; blade narrowly elliptic, 9–13 × 2.5–4.5 cm, subcoriaceous, base cuneate, margin entire, revolute when dry, villous hairs scattered along the margin, apex narrowly acute to acuminate, aristate, arista 1–2 mm long, strigillose, abaxially strigillose especially on midrib and sec-



ondary veins, adaxially glabrous, other parts of blade minutely strigillose; abaxial midrib and secondary veins prominent, adaxial midrib and secondary veins depressed; secondary veins 5–7 pairs, ascending at an angle of 50–70° from midrib, curved to margin and joining veins above, weakly forming a looped venation; tertiary veins subparallel. Stipules triangular, 2–3 × 1–1.5 mm, apex acute or acuminate, persistent, pubescent. Inflorescence sessile, congested, cymose, 1–3 flowered; bracts linear, less than 1 mm long, densely pubescent. Flowers sessile or short pedicellate; pedicel to 0.5 mm long; calyx tube pink, cupulate, 1.7–2 mm long, strigose, deeply dentate; calyx lobes pinkish pale yellow, linear-triangular, 3–4.5 mm long, both surfaces strigose; corolla white, salverform, 5.5–6 mm long, 6–6.5 mm in diam., lobes 5 or 6, ovate, puberulous outside, villous inside. Fruit drupaceous, orange, globose, ca. 4 mm in diam., sparsely strigose, crowned by persistent, strigose calyx lobes; pyrenes 5 or 6.

*Additional specimens examined.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E, 10 Dec. 2011, *Toyama et al.* 1913 (Cam, FU); 16 Jul. 2102, *Tagane et al.* 3978 [fr.] (Cam, FU, P).

*Distribution.* Cambodia (currently known only from Mt. Bokor).

*Note.* *Lasianthus bokorensis* is rare, in primary evergreen forests near top of plateau.

**5. *Lasianthus cambodianus* Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 382 (1924). —Figs. 4A–C.**

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E, 9 Dec. 2011, *Toyama et al.* 1873 (BKF, Cam, FU); 935 m 17 Jul. 2012, *Tagane et al.* 4015 [fl.] (Cam, FU, K, KYO).

*Distribution.* Cambodia (endemic).

*Note.* *Lasianthus cambodianus*, a shrub, 0.8–1.2 m tall, is occasional in moist evergreen forests at high elevations.

**6. *Lasianthus chevalieri* Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 384 (1924); P. H. Hô, Ill. Fl. Vietnam 3: 203, fig. 8512 (2000); H. Zhu, Acta Phytotax. Sin. 39: 123 (2001a); H. Zhu and C. M. Taylor, Fl. China 19: 190 (2011). —Figs. 4D–G.**

*Lasianthus longisepalus* Geddes, Bull. Misc. Inform. Kew 1928: 245 (1928).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E, 9 Dec. 2011, *Toyama et al.* 1894 (Cam, FU); in the same location 10 Dec. 2011, *Toyama et al.* 1972 (Cam, BKF); 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, *Toyama et al.* 3118 (Cam, FU, KYO, P); 941 m, 10°39'05.31"N, 104°03'38.97"E, 22 Dec., *Toyama et al.* 2539 [fl. bud] (Cam, FU); 970 m, 10°37'35.2"N, 104°03'57.30"E, 22 Oct. 2012, *Yahara et al.* 4384 (Cam, K).

*Distribution.* Cambodia (new record), China (Hainan), Thailand, Vietnam.

**7. *Lasianthus chinensis* (Champ.) Benth., Fl. Hongk. 160 (1861); Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 391 (1924); P. H. Hô, Ill. Fl. Vietnam 3: 203, fig. 8513 (2000); H. Zhu & C. M. Taylor, Fl. China 19: 190 (2011); H. Zhu *et al.*, Blumea 57: 27 (2012). —Figs. 5A–G & Fig. 6.**

*Mephitidia chinensis* Champ., Hooker's J. Bot. Kew Gard. Misc. 4: 196 (1852).

*Lasianthus dinhensis* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 388 (1924).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E 10 Dec. 2011, *Toyama et al.* 1937 (Cam, FU, P); in the same location, 16 Jul. 2012, *Tagane et al.* 3979 [fr.] (Cam, FU); 903 m, 10°39'35.42"N, 104°03'03.09"E, 17 Jul. 2012, *Tagane et al.* 4039 [fr.] (Cam, FU); 960 m, 10°38'44.67"N, 104°01'36.78"E, 17 Oct. 2012, *Tagane et al.* 4288 [fl. & fr.] (Cam, FU, KYO); 962 m, 10°38'44.67"N, 104°01'36.78"E, 18 Jul. 2012, *Tagane et al.* 4068 (BKF, Cam, FU, K); 1014 m, 10°38'12.59"N, 104°02'06.37"E, 5 Dec. 2011, *Toyama et al.* 1570 (Cam, FU, KYO); '*L. dinhensis*', Cam Chay, prov. Kamput, Apr. 1870, *Pierre* 3257 (P); '*L. dinhensis*', mont. De l'éléphant, alt. 1000 m, 10 Aug. 1919, *Poillane* 283 (P).

*Distribution.* Cambodia, China, Laos, Malaysia, Philippines, Taiwan, Thailand, Vietnam.

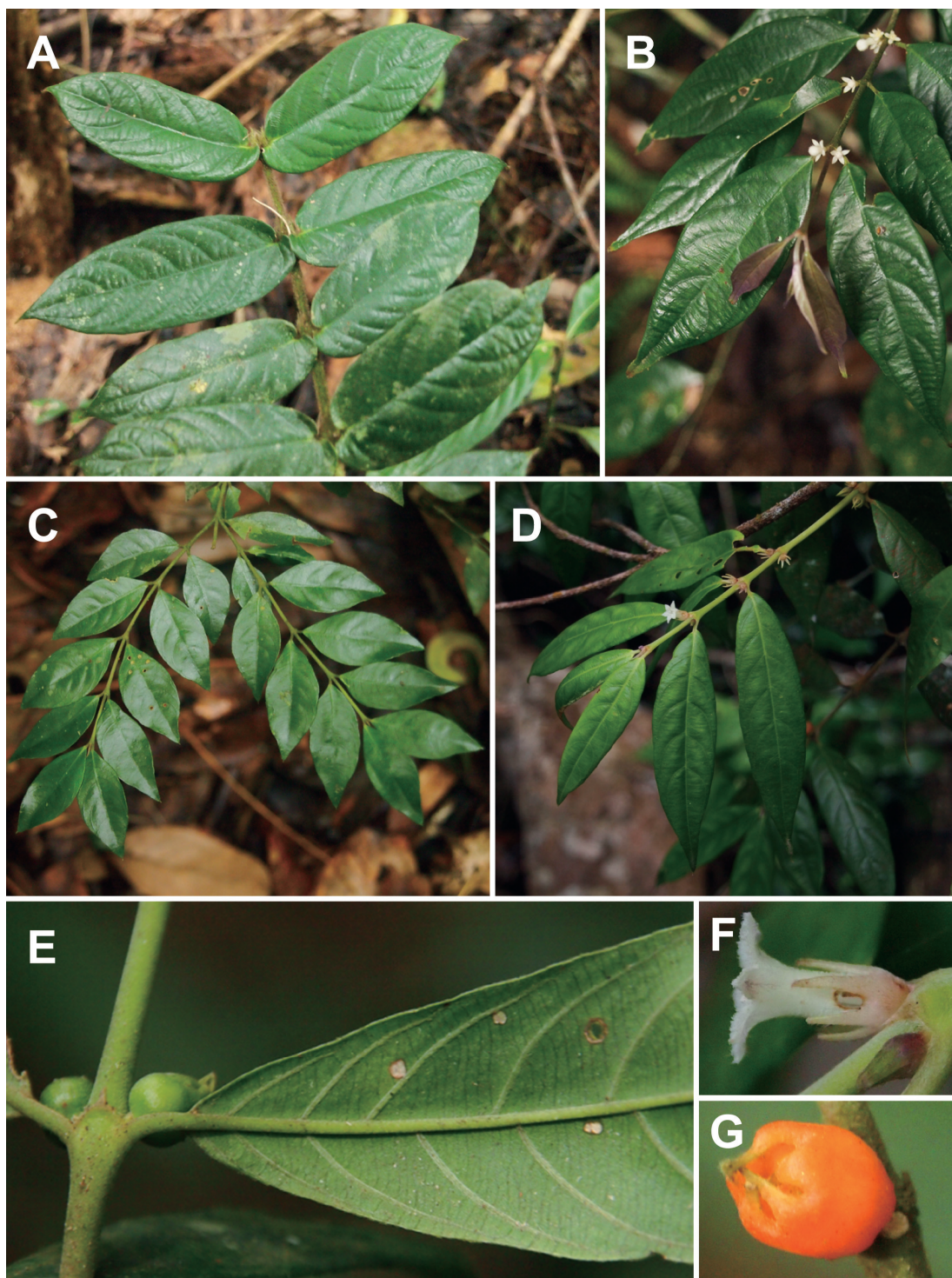


FIG. 2. *Lasianthus attenuatus* Jack (Toyama et al. 3137): A. branch. *Lasianthus austrosinensis* H. S. Lo (Toyama et al. 3096): B. branch with flowers. *Lasianthus biflorus* (Blume) M. Gangop. & Chakrab. (Toyama et al. 3146): C. branches. *Lasianthus bokorensis* Naiki, sp. nov. (Toyama et al. 1842): D. branch with flower; E. portion of abaxial leaf surface; F. flower; G. fruit.



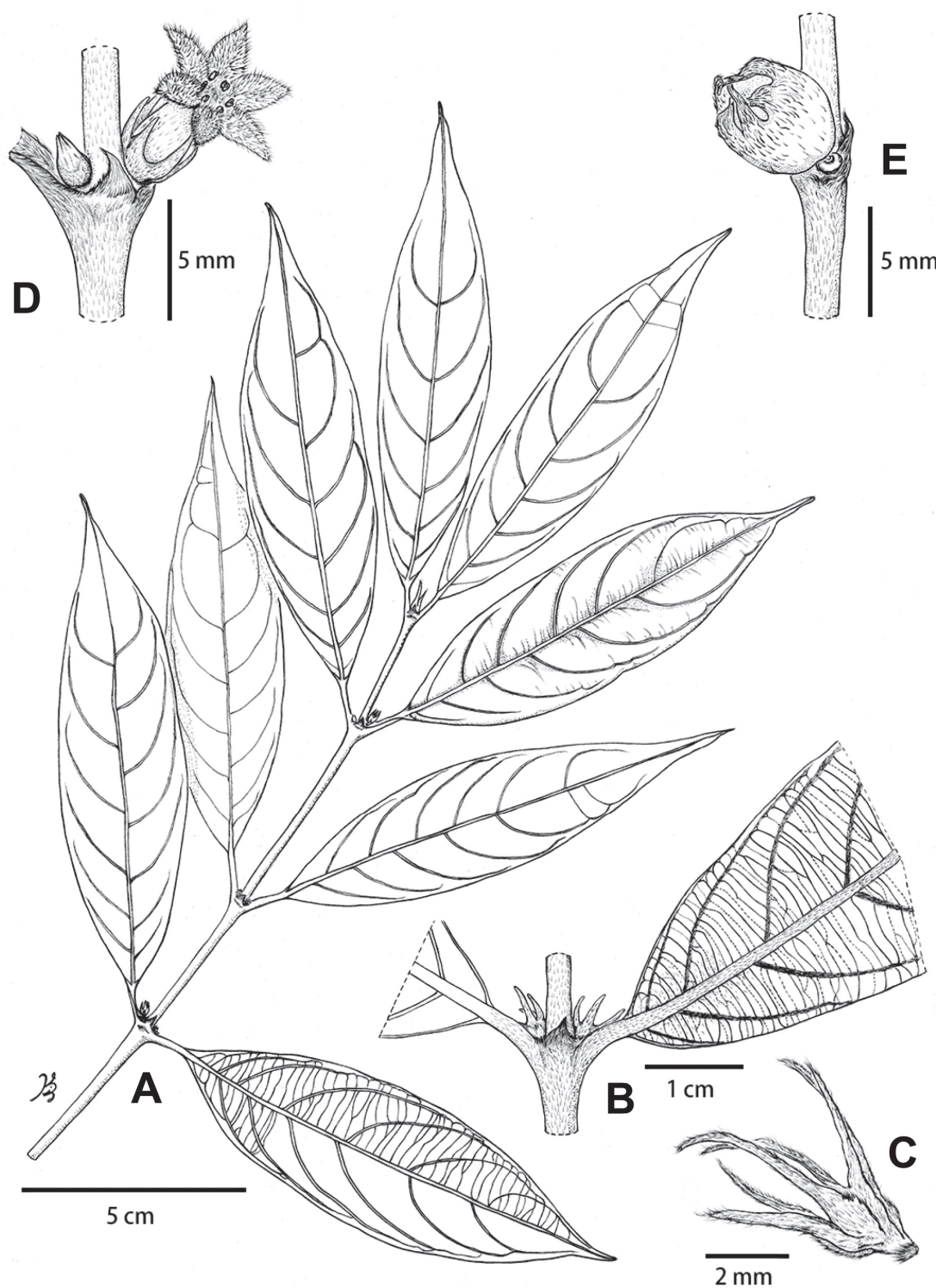


FIG. 3. Line drawing of *Lasianthus bokorensis* Naiki, sp. nov. (Toyama et al. 1842): A. branch; B. abaxial leaf surface; C. calyx; D. flower; E. fruit. Drawn by K. Mase.

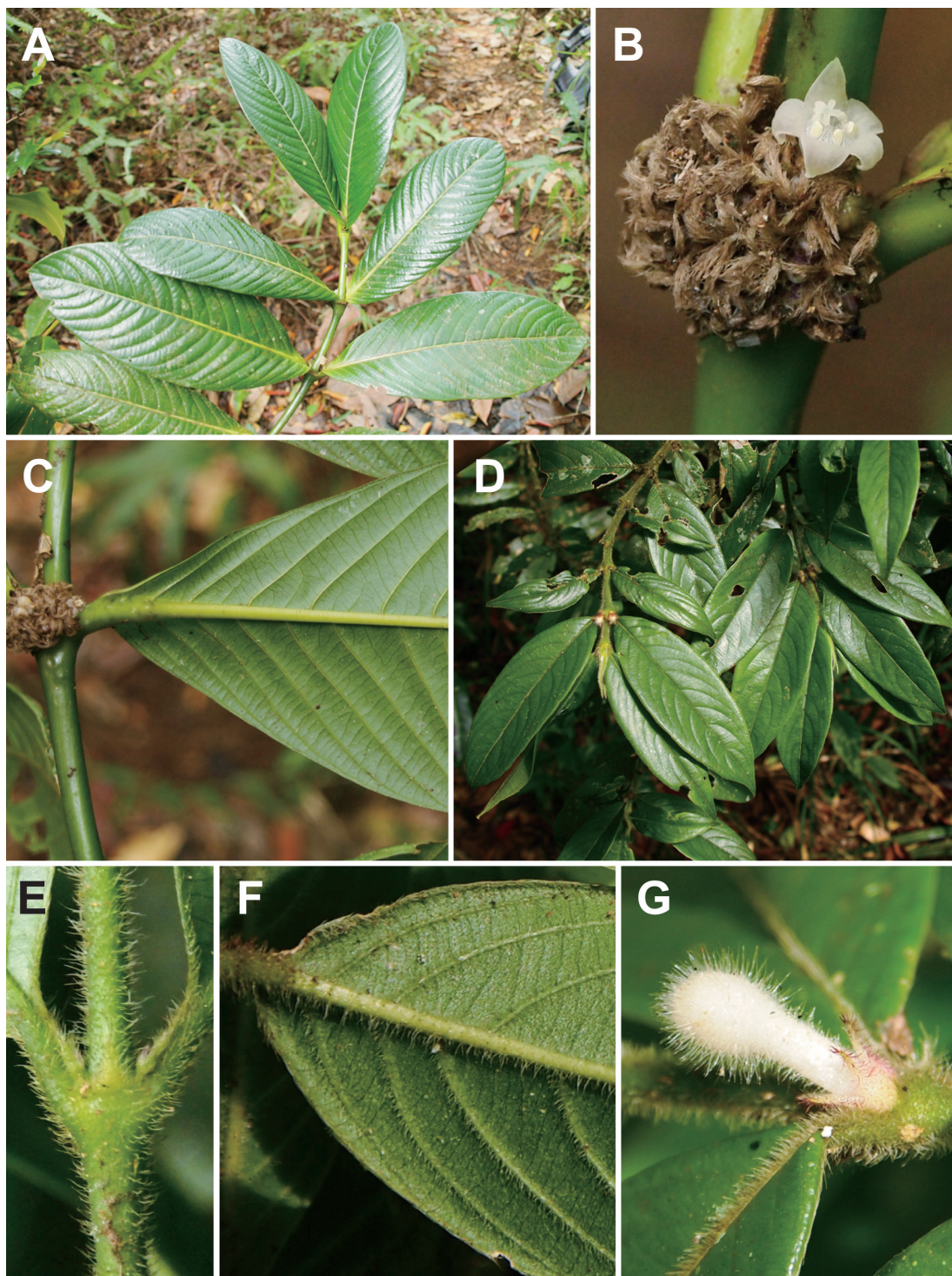


FIG. 4. *Lasianthus cambodianus* Pit. (Tagane et al. 4015): A. branch; B. flower and bracts; C. portion of abaxial leaf surface. *Lasianthus chevalieri* Pit. (Toyama et al. 2539): D. branches; E. stem and stipule; F. portion of abaxial leaf surface; G. flower bud.



*Note.* *Poilane* 283 (P), from Bokor, was identified as *L. dinhensis* by Pitard (1922–1924) who distinguished *L. dinhensis* from *L. chinensis* in having unreflexed calyx lobes. The type specimens of both *L. dinhensis* from Vietnam (*Pierre* 3257, BM, K, MO, P) and *L. chinensis* from China (lectotype: *Champion?* 112, K, designated by Zhu (2001b)) have reflexed calyx lobes. The two specimens cannot be distinguished. In contrast, our flowering collections from Bokor differ from typical *L. chinensis* in having shorter, unreflexed calyx lobes. *Lasianthus chinensis* from Bokor may be varietally different, but further studies are needed to elucidate the nature of the calyx lobes over its entire range.

Among the specimens listed above, the twigs of *Tagane et al.* 4068 and *Tagane et al.* 4288 are nearly glabrous and black when dried.

**8. *Lasianthus chrysoneurus*** (Korth.) Miq., Fl. Ned. Ind. 2: 322. 1857; H. Zhu & C. M. Taylor, Fl. China 19: 190 (2011); H. Zhu *et al.*, Blumea 57: 28 (2012). — Figs. 5H–J.

*Mephitidia chrysoneura* Korth., Ned. Kruidk. Arch. 2 (2): 222 (1851).

*Lasianthus kurzii* Hook.f., Fl. Brit. India 3: 183 (1880).

*Lasianthus hoaensis* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 383 (1924); Dy Phon, Pl. Util. Cambod.: 397 (2000); P. H. Hô, Ill. Fl. Vietnam 3: 206, fig. 8524 (2000).

*Lasianthus hoaensis* var. *microphyllus* Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 383 (1924).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 529 m, 10°36'18.59"N, 104°06'03.12"E, 19 Dec. 2011, *Toyama et al.* 2363 (Cam, FU, K); 888 m, 10°37'15.48"N, 104°05'10.71"E, 9 Dec. 2011, *Toyama et al.* 1782 (BKF, Cam, FU); 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, *Toyama et al.* 3112 (Cam, KYO); in montibus Cam Chay, prov. Kamput, 1874, *Pierre* 3267 (P).

*Distribution.* Cambodia, China (S Yunnan), India (northeast), Indonesia (Java), Laos, Myanmar, Papua New Guinea, Thailand, Vietnam.

*Note.* Bokor is the type locality of *L. hoaensis* var. *microphyllus* (*Poilane* 233, isotypes K, E)

**9. *Lasianthus clementis*** Merr., Philipp. J. Sci. C3: 164 (1908); H. Zhu *et al.*, Blumea 57: 29 (2012). — Figs. 7A–D.

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 741 m, 10°38'04.41"N, 104°05'18.55"E, 19 Jul. 2012, *Tagane et al.* 4095 [fl. & fr.] (Cam, FU, K, KYO); 917 m, 10°39'30.82"N, 104°03'05.14"E, 25 Oct. 2012, *Toyama et al.* 4580 [fr.] (BKF, Cam, FU).

*Distribution.* Cambodia (new record), Indonesia, Papua New Guinea, Philippines.

**10. *Lasianthus curtisii*** King & Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 73(3): 128 (1904) [26 Oct 1904]; H. Zhu, Acta Phytotax. Sin. 39: 126 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 191 (2011); H. Zhu *et al.*, Blumea 57: 33 (2012). — Figs. 7E–F.

*Lasianthus pseudolucidus* King & Gamble, J. Asiat. Soc. Bengal, Pt. 2, Nat. Hist. 73(3): 128 (1904).

*Lasianthus condorensis* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 385 (1924).

*Lasianthus kwangtungensis* Merr., Lingnan Sci. J. 7: 323 (1929).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, *Toyama et al.* 3116 [young fr.] (Cam, FU, K); 928 m, 10°39'19.53"N, 104°03'36.61"E, 9 May 2012, *Toyama et al.* 2825 [young fr.] (Cam, FU).

*Distribution.* Cambodia (new record), China, Indonesia (Sumatra), Japan (Kyushu, Okinawa), Malaysia (Peninsular), Taiwan, Thailand, Vietnam.

**11. *Lasianthus fordii*** Hance, J. Bot. 23: 324 (1885); H. Zhu, Acta Phytotax. Sin. 39: 127 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 191 (2011); H. Zhu *et al.*, Blumea 57: 43 (2012). — Figs. 7G–I.

*Lasianthus tashiroi* Matsum., Bot. Mag. (To-

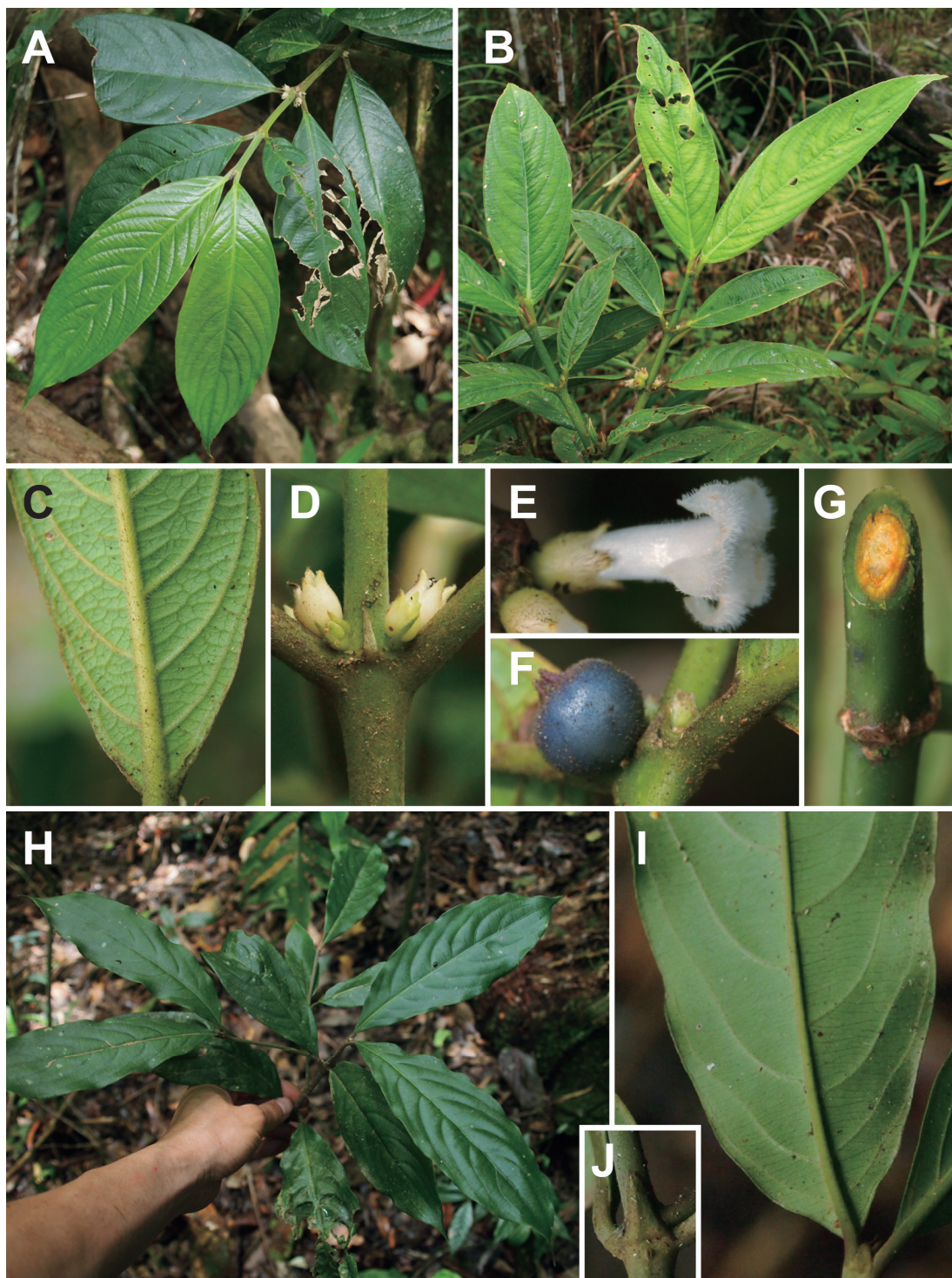


FIG. 5. *Lasianthus chinensis* (Champ.) Benth. (A & D. Tagane *et al.* 4039; B, C, E–G: Tagane *et al.* 4288): A & B. branches; C. portion of abaxial leaf surface; D. stem, calyxes and stipule; E. flower; F. fruit; G. cross section of a stem. *Lasianthus chrysoneurus* (Korth.) Miq. (Toyama *et al.* 3112): H. branches; I. portion of abaxial leaf surface; J. stipule.



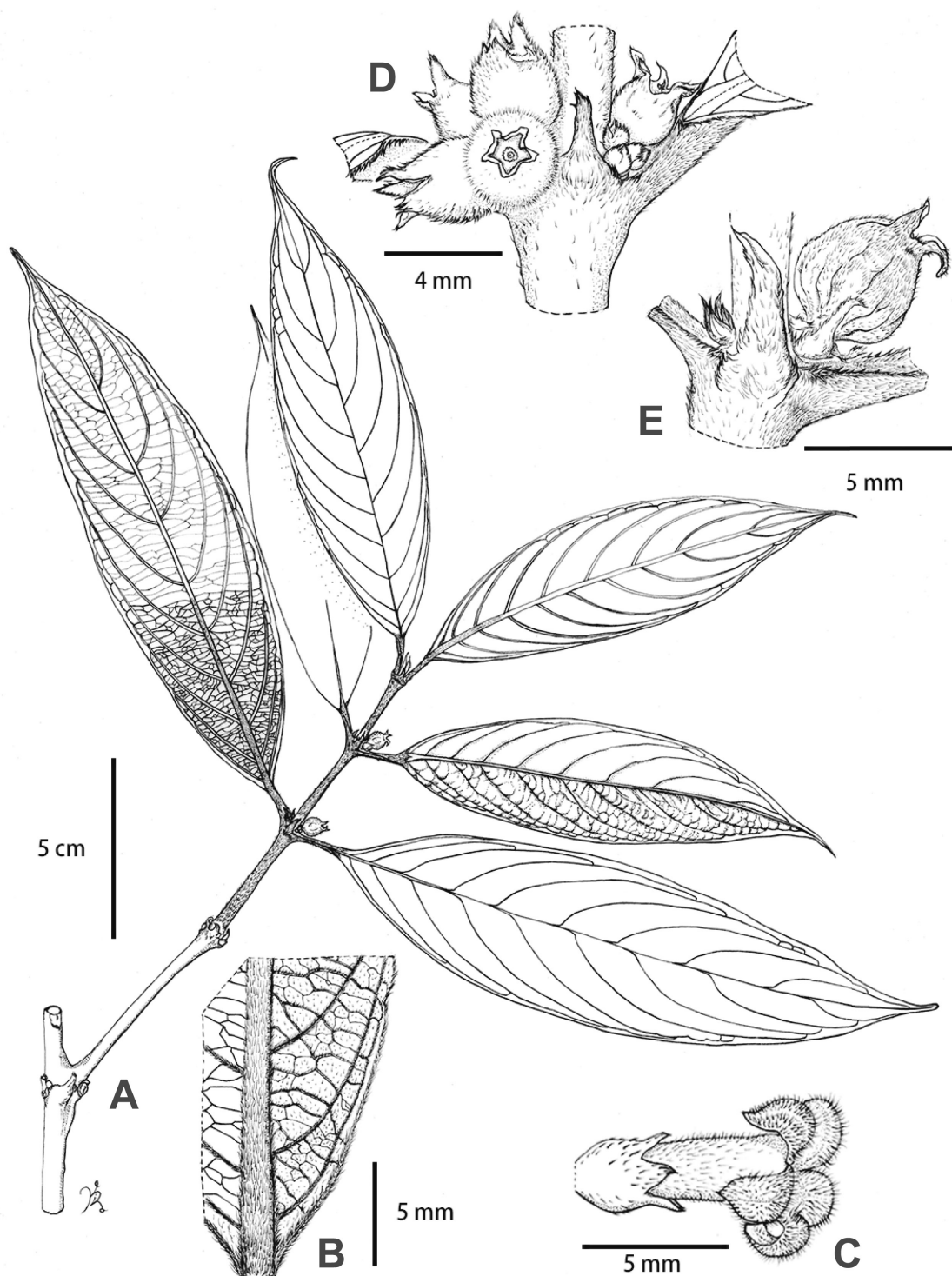


FIG. 6. Line drawing of *Lasianthus chinensis* (Tagane et al. 4068): A. branch with fruit; B. portion of abaxial leaf surface; C. flower; D. fruit; E. dried fruit. Drawn by K. Mase.

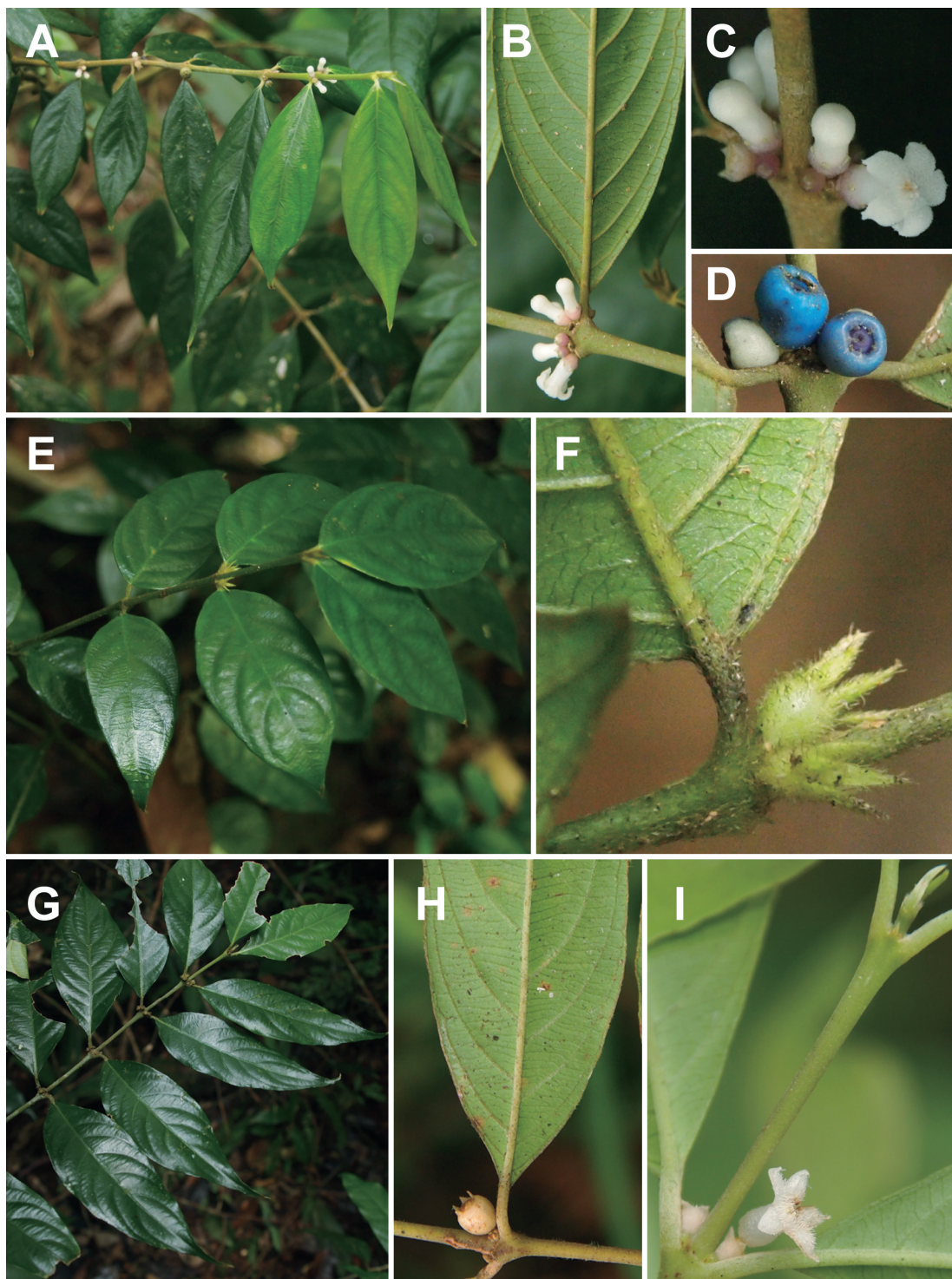


FIG. 7. *Lasianthus clementis* Merr. (Tagane *et al.* 4095): A. branch with flower buds; B. portion of abaxial leaf surface; C. flowers; D. fruit; *Lasianthus curtisii* King & Gamble (Toyama *et al.* 3116): E. branch; F. immature fruits. *Lasianthus fordii* Hance (Tagane *et al.* 4073): G. branch; H. portion of abaxial leaf surface and immature fruit; I. branch with a flower.



kyo) 15: 37 (1901).

*Lasianthus kamputensis* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 392 (1924); Dy Phon, Pl. Util. Cambod.: 398 (2000); P. H. Hô, Ill. Fl. Vietnam 3: 206, fig. 8526 (2000).

*Lasianthus zambalensis* Elmer, Leaf. Philipp. Bot. 9: 3209 (1934).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 707 m, 10°37'41.02"N, 104°05'37.43"E, 11 Dec. 2011, *Toyama et al.* 2029 (BKF, Cam, FU); 760 m, 10°38'02.73"N, 104°05'17.73"E, 24 Oct. 2012, *Yahara et al.* 4490 (Cam, FU); 25 Oct. 2012, *Yahara et al.* 4542 [fr.] (Cam, FU, KYO), 4549 [fl. & fr.] (Cam, FU, KYO); 888 m, 10°37'15.48"N, 104°05'10.71"E, 9 Dec. 2011, *Toyama et al.* 1814 [young fr.] (Cam, FU, P), 1911 (Cam, FU); 890 m, 10°36'52.07"N, 104°02'42.80"E, 18 Oct. 2012, *Tagane et al.* 4325 [fr.] (Cam, K); 903 m, 10°39'35.42"N, 104°03'03.09"E, 13 May 2012, *Toyama et al.* 3095 (Cam, FU); 917 m, 10°39'30.82"N, 104°03'05.14"E, 25 Oct. 2012, *Toyama et al.* 4579 (Cam, FU); 928 m, 10°39'19.53"N, 104°03'36.61"E, 9 May 2012, *Toyama et al.* 2773, 2774, 2785 [fr.] & 2826 (Cam, FU); in the same location, 10 May 2012; *Toyama et al.* 2835 (Cam, FU); 17 Jul. 2012, *Tagane et al.* 4011 [fr.] (Cam, FU); 962 m, 10°38'44.67" N, 104°01'36.78"E, 18 Jul. 2012 *Tagane et al.* 4073 [fl.] (Cam, FU); 1014 m, 10°38'12.59"N, 104°02'06.37"E, 4 Dec. 2011, *Toyama et al.* 1480 (Cam, FU); in the same location, 5 Dec. 2011, *Toyama et al.* 1632 (Cam, FU).

*Distribution* Cambodia, China, India (north-east), Indonesia (Irian Jaya, Java, Lesser Sunda Islands, Moluccas, Sulawesi), Japan (Kyushu, Okinawa), Papua New Guinea, Philippines, Taiwan, Thailand, Vietnam.

*Note.* The twigs, stipules and veins on the abaxial surface of the leaves of all the specimens from Bokor National Park listed above are strigose or strigillose. Lo (1993) described *L. fordii* var. *trichocladus* H. S. Lo from southern China (Guangdong, Guangxi, and Hainan) as having densely appressed pubescent twigs. None of the specimens from Bokor National Park can be attributed to *L. fordii* var. *trichocladus*.

The apex of the leaves of some specimens (*Toyama et al.* 1480, 2785, 2835, and *Tagane et al.* 4073) are narrowly acuminate to caudate, as in *L. saxorum*, but this feature is variable and continuous between *L. fordii* and *L. saxorum*. Further study of *L. fordii* and related species, *L. clemen-*

*tis*, *L. formosensis*, and *L. saxorum* is required.

**12. *Lasianthus giganteus* Naiki, sp. nov. — Figs. 8A–D & Fig. 9.**

Similar to *L. cambodianus*, but differing in having broader bracts and the adaxial surface of the leaf blade almost flat.

*Typus.* CAMBODIA. Bokor National Park, alt. 960 m, 10°38'44.67"N, 104°01'36.78" E, in moist evergreen forest, 17 Oct. 2012, *Tagane S.*, *Fuse K.*, *Choeun H. N.* 4279 (holotype–KYO; isotypes–Cam, K).

*Description.* Treelet, evergreen, to 2 m tall; twigs terete, 4–7 mm in diam., youngest twigs villous, hairs caducous and older twigs almost glabrous. Leaves opposite; petiole 15–25 mm long, villous when young, sparsely pubescent abaxially in age; blade elliptic to lanceolate, 21–31 × 9–11 cm, thickly coriaceous, base oblique (asymmetric), margin entire, apex acute or aristate, arista 1–2 mm long, adaxially glabrous except for small villous part (3–4 mm × 1–3 mm) near base of narrower half of blade, abaxial midrib sericeous, other parts pubescent, abaxial midrib and veins prominent, adaxial midrib and veins slightly depressed to flat; secondary veins 16–17 pairs, ascending at an angle of 50–70° from midrib, curved to margin; tertiary veins subparallel. Stipules triangular, 3–7 × 3–5 mm, persistent, pilose. Inflorescences sessile, with bracts and many bracteoles; bracts oblong to oblong-lanceolate, 15–18 × 5–7 mm, apex acuminate or apiculate, apiculi ca. 4 mm long, sericeous with brown hairs, densely so along axis outside, densely sericeous inside, bracteoles narrowly lanceolate to linear, 5–18 mm long, densely pilose on both surfaces, more densely so inside. Flowers not seen. Fruit drupaceous, blue, conical, 12 mm long, 10 mm in diam., sparsely pilose, more densely so near persistent calyx lobes; pyrenes 5 or 6.

*Additional specimen examined.* CAMBODIA. Bokor National Park, alt. 928 m, 10°39'19.53"N, 104°03'36.61"E, 17 Jul. 2012, *Tagane et al.* 4012 (BKF, Cam, FU, P).

*Distribution.* Cambodia (currently known

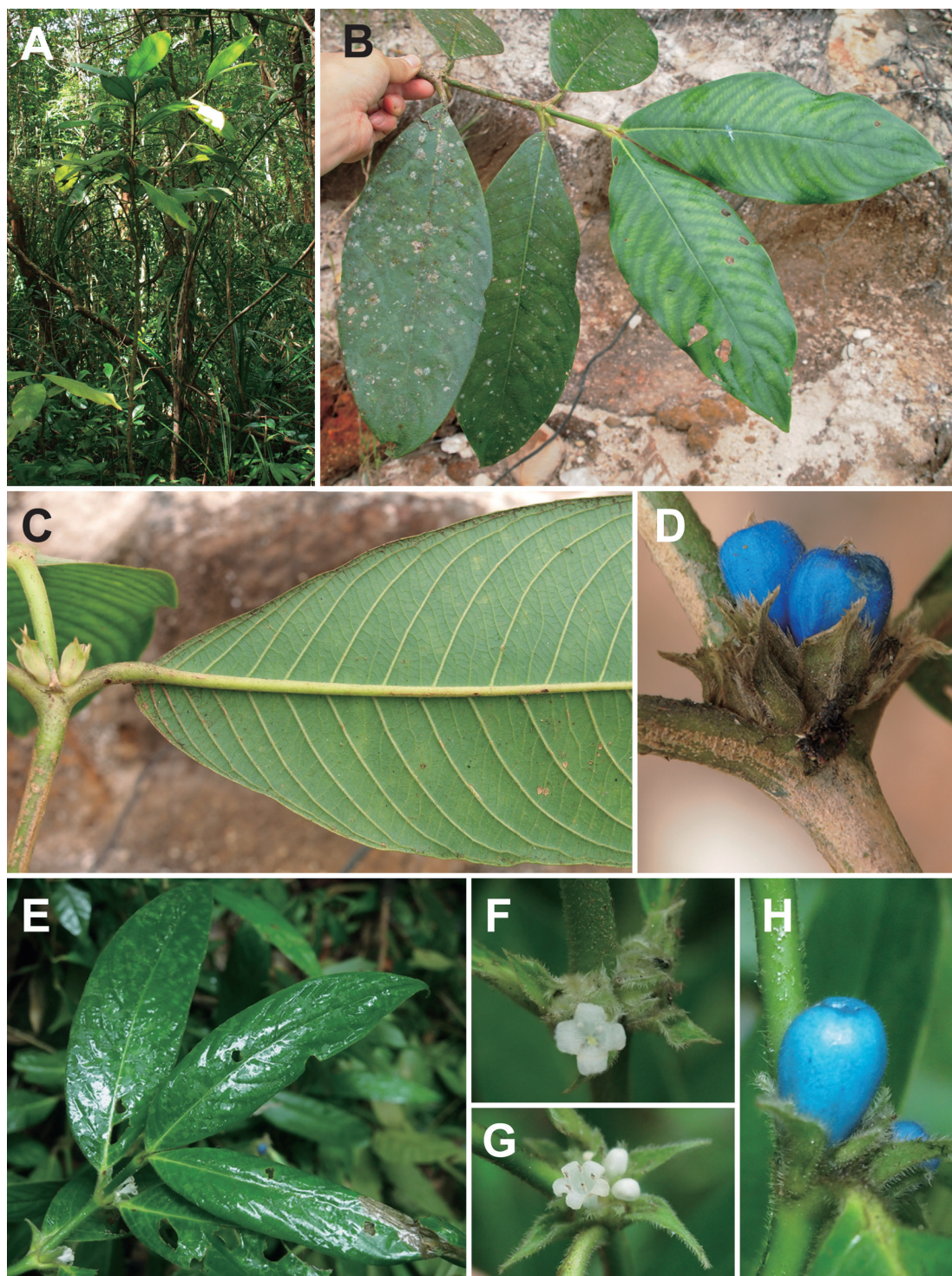


FIG. 8. *Lasianthus giganteus* Naiki, sp. nov. (Tagane *et al.* 4279): A. habit; B. branch; C. portion of abaxial leaf surface and bracts; D. fruits and bracts. *Lasianthus hirsutus* (Roxb.) Merr. (Tagane *et al.* 5853): E. branch with flowers; F & G. flowers with bracts; H. fruits. Photographs by K. Fuse.



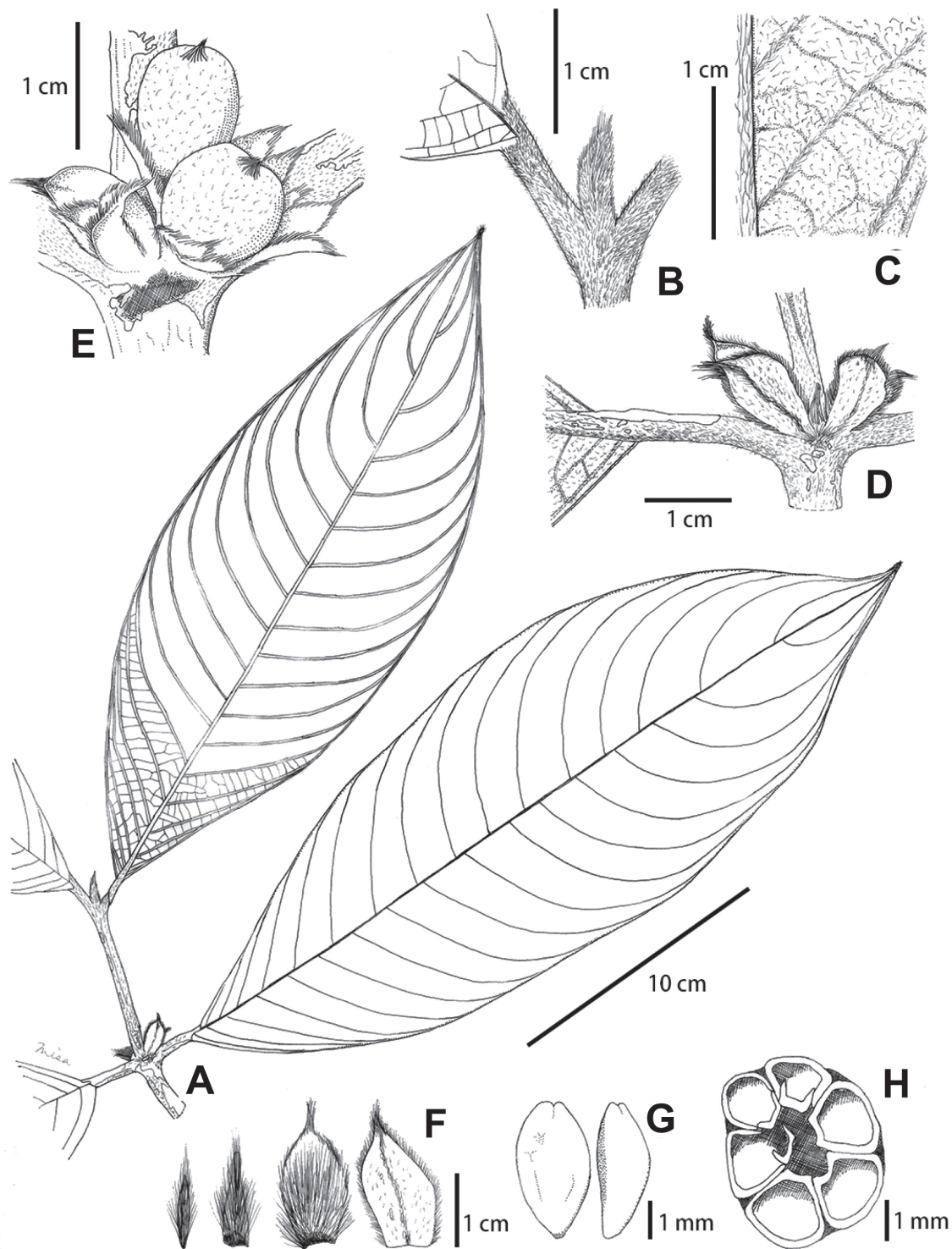


FIG. 9. Line drawing of *Lasianthus giganteus* Naiki, sp. nov. (Tagane et al. 4279): A. branch; B. shoot apex; C. portion of abaxial leaf surface; D. leaf base and bracts; E. fruits; F. bracts (left two: inner ones, right two: outer ones); G. seeds; H. vertical section of fruit. Drawn by M. Tagane.

only from Mt. Bokor).

*Note.* *Lasianthus giganteus* is occasional, but locally abundant, especially in semi-shaded primary evergreen forests near Popokvil Sphagnum bog on the plateau.

**13. *Lasianthus hirsutus* (Roxb.) Merr., J. Arnold Arbor. 33(3): 229 (1952); H. Zhu, Acta Phytotax. Sin. 39: 129 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 192 (2011); H. Zhu *et al.*, Blumea 57: 47 (2012). —Figs. 8E–I.**

*Triosteum hirsutum* Roxb., Fl. Ind. (Carey & Wallich ed.) 2: 180 (1824).

*Lasianthus cyanocarpus* Jack var. *asperatus* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 381 (1924); P. H. Hô, Ill. Fl. Vietnam 3: 204, fig. 8515 (2000).

*Lasianthus cyanocarpus* var. *lucidulus* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 382 (1924).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 167 m, 10°36'10.06"N, 103°58'58.19"E, 7 Dec. 2013, *Tagane et al.* 6024 (Cam, FU); 370 m, 10°36'33.60"N, 104°04'12.60"E, 10 Aug. 2013 *Tagane et al.* 5853 [fl. & fr.] (Cam, FU, P); 707 m, 10°37'41.02"N, 104°05'37.43"E, 11 Dec. 2011, *Toyama et al.* 2018 [fl.] (Cam, FU); 970 m, 10°37'35.20"N, 104°03'57.30"E, 22 Oct. 2012, *Yahara et al.* 4421 (Cam, FU); 1014 m, 10°38'12.59"N, 104°02'06.37"E, 4 Dec. 2011, *Toyama et al.* 1476 (Cam, FU, KYO); 1014 m, 10°38'11.49"N, 104°02'07.15"E, 11 Dec. 2011, *Toyama et al.* 3221 [fl. & fr.] (Cam, FU, K)

*Distribution.* Bangladesh, Cambodia, China, Japan (Okinawa), India, Indonesia, Laos, Malaysia, Myanmar, Papua New Guinea, Philippines, Taiwan, Thailand, Vietnam.

**14. *Lasianthus hispidulus* (Drake) Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 382 (1924). —Figs. 10A–B.**

P. H. Hô, Ill. Fl. Vietnam 3: 205, fig. 8523 (2000); H. Zhu, Acta Phytotax. Sin. 39: 130 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 192 (2011); H. Zhu *et al.*, Blumea 57: 48 (2012).

*Mephitidia hispidula* Drake, J. Bot. (Morot) 9: 239 (1895).

*Lasianthus brevidens* Craib, Kew Bull. 1933: 19 (1933).

*Lasianthus bunzanensis* Simizu, Trans. Nat. Hist. Soc. Taiwan 34: 301 (1944b).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 707 m, 10°37'41.02"N, 104°05'37.43"E, 11 Dec. 2011, *Toyama et al.* 2031 (Cam, FU); 741 m, 10°38'04.41"N, 104°05'18.55"E, 19 Jul. 2012, *Tagane et al.* 4096 [fl. & fr.] (Cam, K, KYO); 760 m, 10°38'02.73"N, 104°05'17.73"E, 24 Oct. 2012, *Yahara et al.* 4520 [fr.] (BKF, Cam, FU).

*Distribution.* Cambodia (new record), China, Indonesia (Irian Jaya, Java, Sumatra), Japan (Okinawa), Malaysia (Borneo), Papua New Guinea, Taiwan, Thailand, Vietnam.

**15. *Lasianthus inodorus* Blume, Bijdr. Fl. Ned. Ind. 16: 998 (1826).**

subsp. *inodorus* H. Zhu, Acta Phytotax. Sin. 39: 132 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 185 (2011); H. Zhu *et al.*, Blumea 57: 48 (2012). —Figs. 10C–F.

*Lasianthus tubiferus* Hook. f. Fl. Brit. India 3: 183 (1880).

*Lasianthus poilanei* Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 398 (1924); P. H. Hô, Ill. Fl. Vietnam 3: 208, fig. 8532 (2000).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 888 m, 10°37'15.48"N, 104°05'10.71"E, 9 Dec. 2011, *Toyama et al.* 1844 (BKF, Cam, FU); 16 Jul. 2012, *Tagane et al.* 3974 [fr.] (Cam, KYO); 935 m, 10°39'09.06"N, 104°03'38.68"E, 17 Jul. 2012, *Tagane et al.* 4017 [fl. & fr.] (Cam, FU, K).

*Distribution.* Bangladesh, Cambodia, China (Yunnan), India (northeast), Indonesia (Java, Sumatra), Thailand, Vietnam.

*Note.* Mt. Bokor is the type locality of *L. poilanei* (*Poilane* 234, Mont de l'Eléphant, alt. 1000 m, holotype P, isotype E, K).

**16. *Lasianthus latifolius* (Blume ex DC.) Miq., Fl. Ned. Ind. 2: 320 (1857). —Figs. 10G–I.**

*Mephitidia latifolia* Blume ex DC., Prodr. 4:



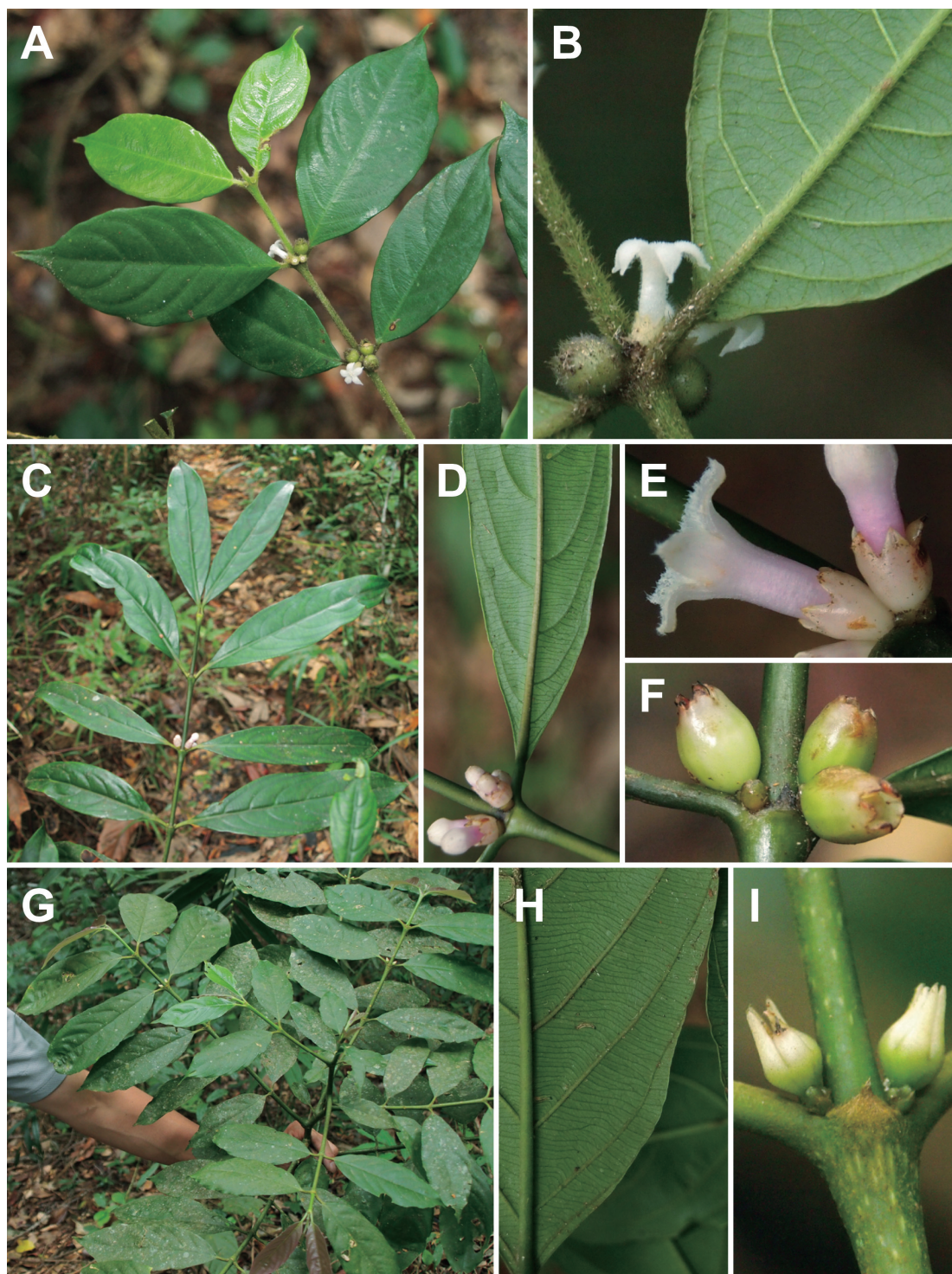


FIG. 10. *Lasianthus hispidulus* (Drake) Pit. (Tagane et al. 4096): A. branch with flowers and immature fruit; B. portion of abaxial leaf surface with flowers and immature fruits. *Lasianthus inodorus* Blume var. *inodorus* (Tagane et al. 4017): C. branch with flower buds; D. portion of abaxial leaf surface and flower buds; E. flowers; F. immature fruit. *Lasianthus latifolius* (Blume ex DC.) Miq. (Tagane et al. 4097): G. habit; H. portion of abaxial leaf surface; I. stipule and immature fruit.

453 (1830).

*Nonatelia latifolia* (Blume ex DC.) Kuntze, Revis. Gen. Pl. 1: 291 (1891).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 741 m, 10°38'04.41"N, 104°05'18.55"E, 19 Jul. 2012, *Tagane et al.* 4097 [fr.] (BKF, Cam, FU).

*Distribution.* Cambodia (new record), Indonesia (Borneo, Java, Sumatra).

*Note.* *Lasianthus latifolius*, a shrub 2–4 m tall, is occasional in evergreen forests between 600 and 750 m.

**17. *Lasianthus oblanceolatus* Naiki, Tagane & Yahara, sp. nov.** —Figs. 11A–C & Fig. 12.

Similar to *L. sarmentosus* in its sparsely pubescent to glabrescent twigs, chartaceous leaf blade, but differing in having longer petioles and larger, elliptic to oblanceolate leaf blades.

*Typus.* CAMBODIA. Bokor National Park, alt. 903 m, 10°39'35.42"N, 104°03'03.09"E, in moist evergreen forest near a stream, 13 May 2013, *Toyama H.*, *Tagane S.*, *Mishima T.*, *Tagawa K.*, *Zang M.*, *Chhang P.*, *Iwanaga F.*, *Nagamasu H.* & *Yahara T.* 3108 (holotype–KYO; isotypes–Cam, FU).

*Description.* Shrubs, evergreen, ca. 1 m tall; twigs terete, 1.5–2.5 mm in diam., sparsely pubescent to glabrescent. Leaves opposite; petiole 7–10 mm long, pubescent to sparsely pubescent; blade oblanceolate to elliptic, 11–12.5 × 3.5–4 cm, chartaceous, base cuneate or slightly oblique, margin entire, slightly revolute, apex acuminate to slightly caudate, young leaves densely pubescent, later abaxial veins sparsely strigose, adaxially glabrous; midrib prominent abaxially, depressed adaxially; secondary veins 6 or 7 pairs, ascending at an angle of 60–80° from midrib, curved near margin and joining secondary veins above one, weakly forming a looped venation, prominent abaxially, depressed adaxially; tertiary veins subparallel, faintly visible abaxially. Stipules triangular, 1.5–2 × 1 mm, persistent, pilose, apex acute. Inflorescences cymose, sessile or pedunculate; peduncle ca. 0.5 mm long; bracts

absent. Flowers sessile, congested; corolla not seen; calyx tube of young buds campanulate, 1 mm long, densely villous; calyx lobes triangular-elliptic, 1 mm long, pubescent on both surfaces, open corolla not seen. Fruit drupaceous, blue, globose 4–5 mm in diam., sparsely strigillose; pyrenes 4 or 5.

*Additional specimen examined.* CAMBODIA. Bokor National Park: alt. 903 m, 10°39'35.42" N, 104°03'03.09"E, 17 Jul. 2012, *Tagane et al.* 4051 (Cam, FU, K).

*Distribution.* Cambodia (currently known only from Mt. Bokor).

*Note.* *Lasianthus oblanceolatus* is rare in moist primary evergreen forest near Popokvil waterfall.

**18. *Lasianthus repoeuensis* Pierre ex Pit., Fl. Indo-Chine [P. H. Lecomte *et al.*] 3: 387 (1924); H. Zhu, Acta Phytotax. Sin. 39: 140 (2001a).** —Figs. 11D–G.

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 444 m, 10°36'24.04"N, 104°05'35.85"E, 11 May 2012, *Toyama et al.* 2978 (Cam, FU, K); 529 m, 10°36'18.59"N, 104°06'03.12"E, 13 Dec. 2011, *Toyama et al.* 2176 (Cam, FU, KYO); in the same locality, 19 Dec. 2011, *Toyama et al.* 2326 (BKF, Cam, FU).

*Distribution.* Cambodia, Thailand, Vietnam.

**19. *Lasianthus sarmentosus* Craib, Kew Bull. 1933: 25 (1933); H. Zhu, Acta Phytotax. Sin. 39: 141 (2001a).** —Figs. 11H–J.

*Specimen examined.* CAMBODIA. Bokor National Park, alt. 760 m, 10°38'02.73"N, 104°05'17.73"E, 23 Oct. 2012, *Yahara et al.* 4469 [young fr.] (Cam, FU).

*Distribution.* Cambodia (new record), Thailand (Chantaburi).

*Note.* *Lasianthus sarmentosus* is characterized by having glabrous, greenish branchlets and thinner leaves.



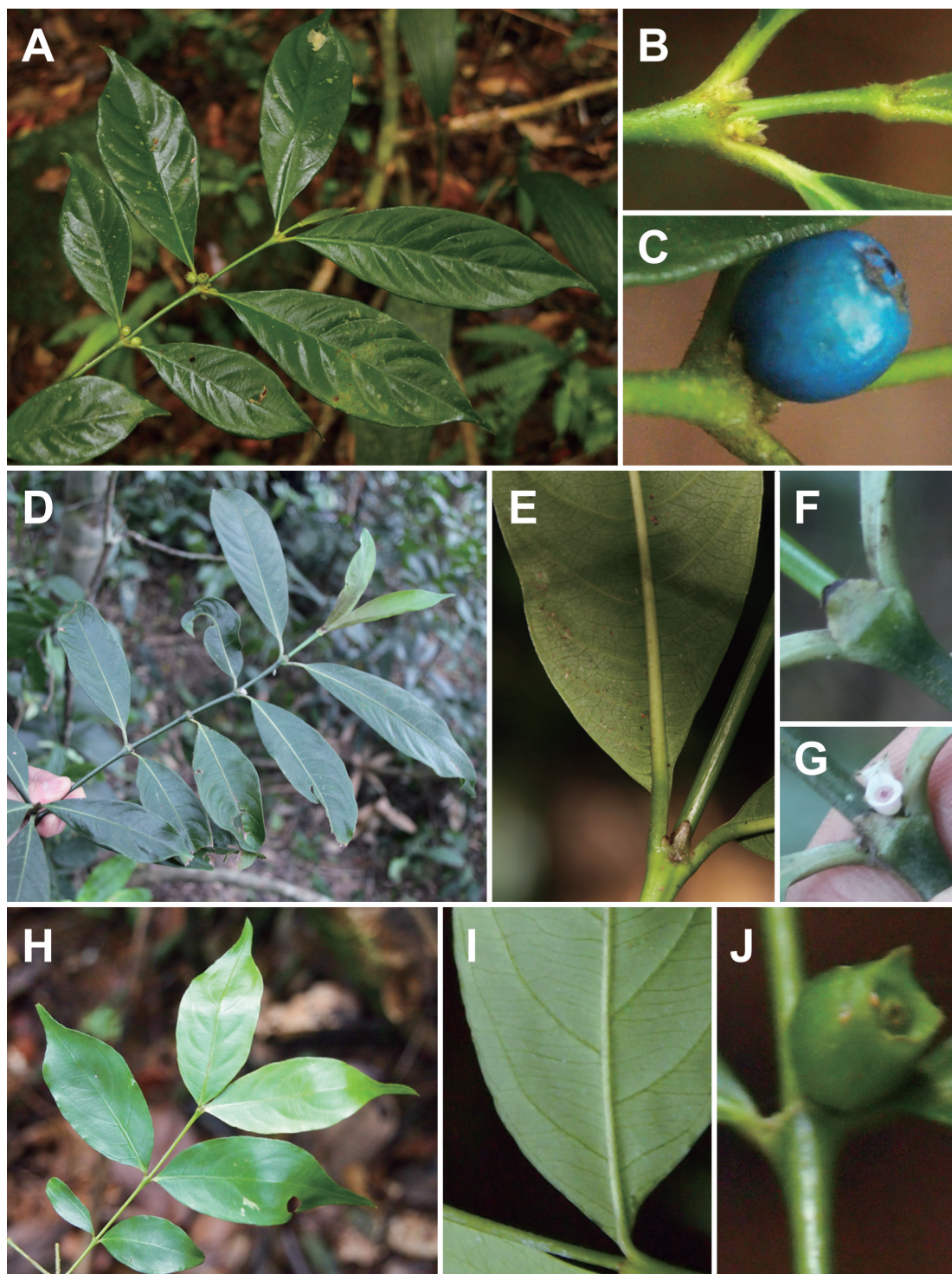


FIG. 11. *Lasianthus oblanceolatus* Naiki, Tagane & Yahara, sp. nov. (Toyama *et al.* 3108): A. branch; B. stipule; C. fruit. *Lasianthus repoeuensis* Pierre ex Pit. (D, F & G: Toyama *et al.* 2176, E: Toyama *et al.* 2326): D. branch; E. portion of abaxial leaf surface; F. stipule; G. calyx; *L. sarmentosus* Craib (Yahara *et al.* 4469): H. branch, I. portion of abaxial leaf surface; J. immature fruit.

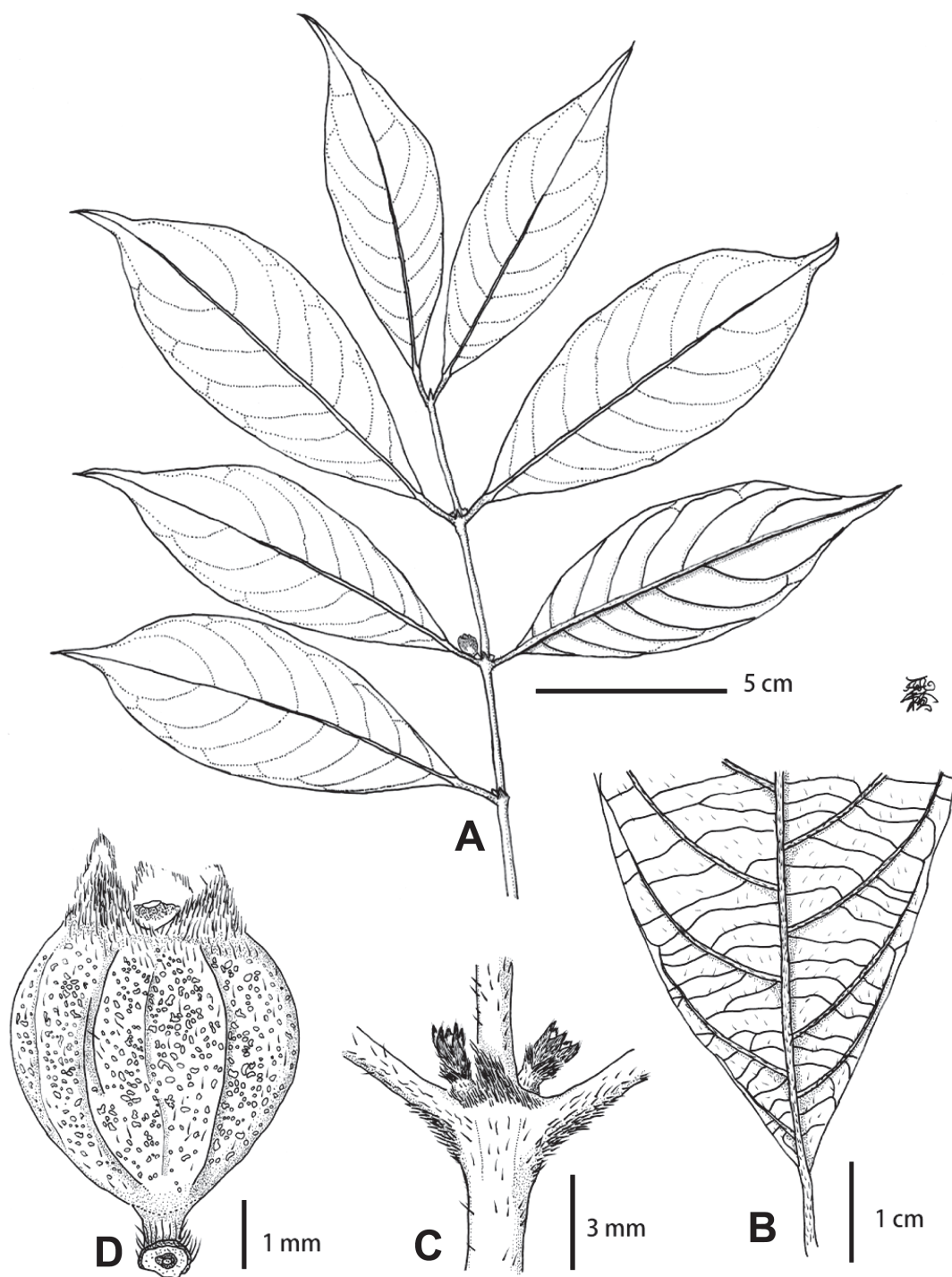


FIG. 12. Line drawing of *Lasianthus oblanceolatus* Naiki, Tagane & Yahara, sp. nov. (Toyama et al. 3108): A. branch with fruit; B. portion of abaxial leaf surface; C. stipule; D. fruit. Drawn by H. Seto.

**20. *Lasianthus stephanocalycinus* Naiki, Tagane & Yahara, sp. nov.** —Figs. 13A–E & Fig. 14.

Similar to *L. hispidulus* in its villous twigs and elliptic leaves, but differing in the larger calyx lobes and depressed midrib and secondary veins on the upper surface of the leaves.

*Typus.* CAMBODIA. Bokor National Park, alt. 903 m, 10°39'35.42"N, 104°03'03.09"E, in moist evergreen forest, 13 May 2012, Toyama H., Tagane S., Mishima T., Tagawa K., Zhang M., Chhang P., Iwanaga F., Nagamasu H. & Yahara T. 3100 (holotype–KYO; isotypes–Cam, K, P).

*Description.* Shrubs, evergreen, ca. 1.5 m tall; twigs terete, 1.5–3 mm in diam., villous. Leaves opposite; petiole 3–5 mm long, villous; blade elliptic, 8–9.5 × 3–3.5 cm, coriaceous, base cuneate, margin entire, apex narrowly acute to aristate, arista 2–3 mm long, villous, abaxially villous especially on the midrib and secondary veins, adaxially glabrous, other part sparsely villous; midrib and secondary veins prominent abaxially, depressed adaxially; secondary veins 4–9 pairs (4–6 in plants of Mt. Bokor, (4–)7–9 in plants of Mt. Hon Ba), ascending at an angle of 50–60° from midrib, curved to margin; tertiary veins parallel. Stipules triangular, 2–3 by 1–1.5 mm, persistent, villous. Inflorescences cymose, sessile, 1–7 flowered; bracts linear, 1 mm long, pilose. Flowers congested; pedicel 0.5–1 mm long; calyx tube campanulate, ca. 2 mm long, 2 mm in diam., pilose; calyx lobes 5 or 6, narrowly triangular, 2.5–3 mm long, apex acute or acuminate, pubescent on both surfaces; corolla not seen. Fruit drupaceous, immature, hemispheric, 3–4 mm long, 5 mm in diam., pubescent (on Mt. Bokor) to sparsely villous (on Mt. Hon Ba), crowned by persistent pubescent triangular (3 × 2 mm) calyx lobes; pyrenes 5.

*Additional specimens examined.* VIETNAM. Khanh Hoa Province: Mt. Hon Ba, in moist evergreen forest along stream, alt. 400 m, 14 Jul. 2014, Tagane *et al.* V1618 (FU, VNM, the herbarium of Hon Ba Nature Reserve); in evergreen forest, alt. 919 m, 16 Jul. 2014, Tagane *et al.* V1711 (FU, P, VNM, the herbarium of Hon Ba Nature Reserve).

*Distribution.* Cambodia (Mt. Bokor), Vietnam (Mt. Hon Ba).

*Note.* Plants on Mt. Hon Ba are more densely hairy (Figs. 13D & E) than those on Mt. Bokor (Figs. 13A–C).

*Note.* *Lasianthus stephanocalycinus* is occasional in primary evergreen forests and along streams.

**21. *Lasianthus verticillatus* (Lour.) Merr.,** Trans. Amer. Philos. Soc. ser. 2, 24(2): 372 (1935); P. H. Hô, Ill. Fl. Vietnam 3: 209, fig. 8537 (2000); H. Zhu, Acta Phytotax. Sin. 39: 144 (2001a); H. Zhu & C. M. Taylor, Fl. China 19: 197 (2011); H. Zhu *et al.*, Blumea 57: 93 (2012). —Figs. 13F–H.

*Dasus verticillatus* Lour., Fl. Cochinch. 1: 141 (1790).

*Lasianthus truncatus* Bedd., Icon. Pl. Ind. Or. [Beddome] 2 (1868).

*Lasianthus andamanicus* Hook. f., Fl. Brit. India 3: 189 (1880).

*Lasianthus obliquinervis* Merr., Philipp. J. Sci. 1(Suppl.): 136 (1906).

*Lasianthus tamirensis* Pierre ex Pit., Fl. Indo-Chine [P.H. Lecomte *et al.*] 3: 390 (1924).

*Lasianthus taitoensis* Simizu, Trans. Nat. Hist. Soc. Taiwan 34: 239 (1944a).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 444 m, 10°36'24.04"N, 104°05'35.85"E, 12 May 2012, Toyama *et al.* 3018 (Cam, FU).

*Distribution.* Cambodia, China, India (Andaman and Nicobar Islands), Indonesia (Java, Lesser Sunda Islands, Sulawesi, Sumatra), Japan (Okinawa), Laos, Malaysia (Peninsular, Sabah), Myanmar, Papua New Guinea, Philippines, Sri Lanka, Taiwan, Thailand, Vietnam.

**22. *Lasianthus viridiramulis* Tagane, nom. nov.** —Figs. 15A–C.

*Lasianthus brevipes* Craib, Bull. Misc. Inform. Kew. 1933(1): 20 (1933) non Valetton (1927).

*Saprosma brevipes* (Craib) H. Zhu, Acta Phy-



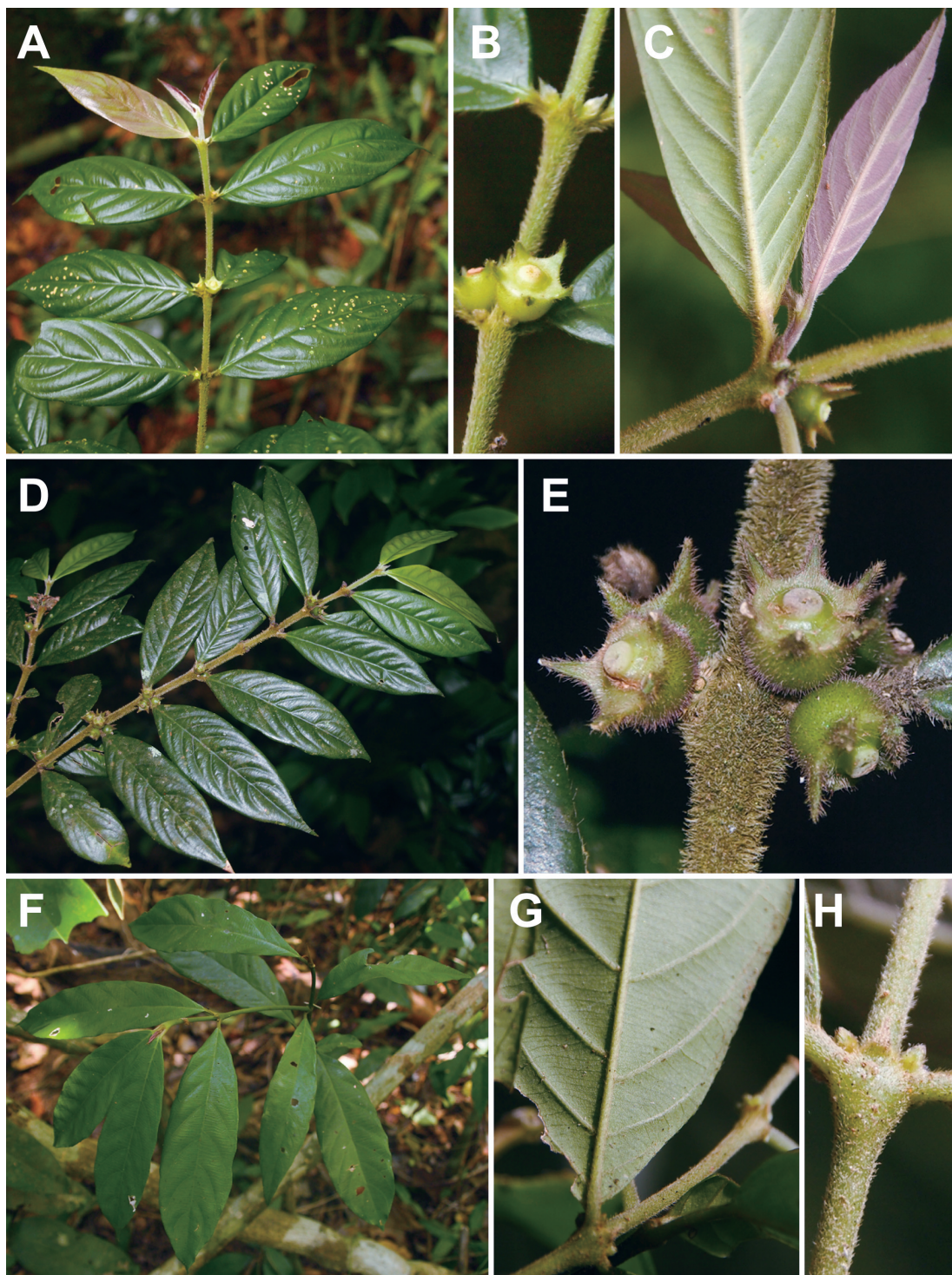


FIG. 13. *Lasianthus stephanocalycinus* Naiki, Tagane & Yahara, sp. nov. (A–C: Toyama *et al.* 3100, from Mt. Bokor, Cambodia; D–E: Tagane *et al.*, V1618 from Mt. Hon Ba, Vietnam): A. branch with calyces; B. immature fruits; C. portion of abaxial leaf surface and immature fruit. D. branch with immature fruit; E. immature fruit. *Lasianthus verticillatus* (Lour.) Merr. (Toyama *et al.* 3018): F. branches; G. portion of abaxial leaf surface; H. stipule.



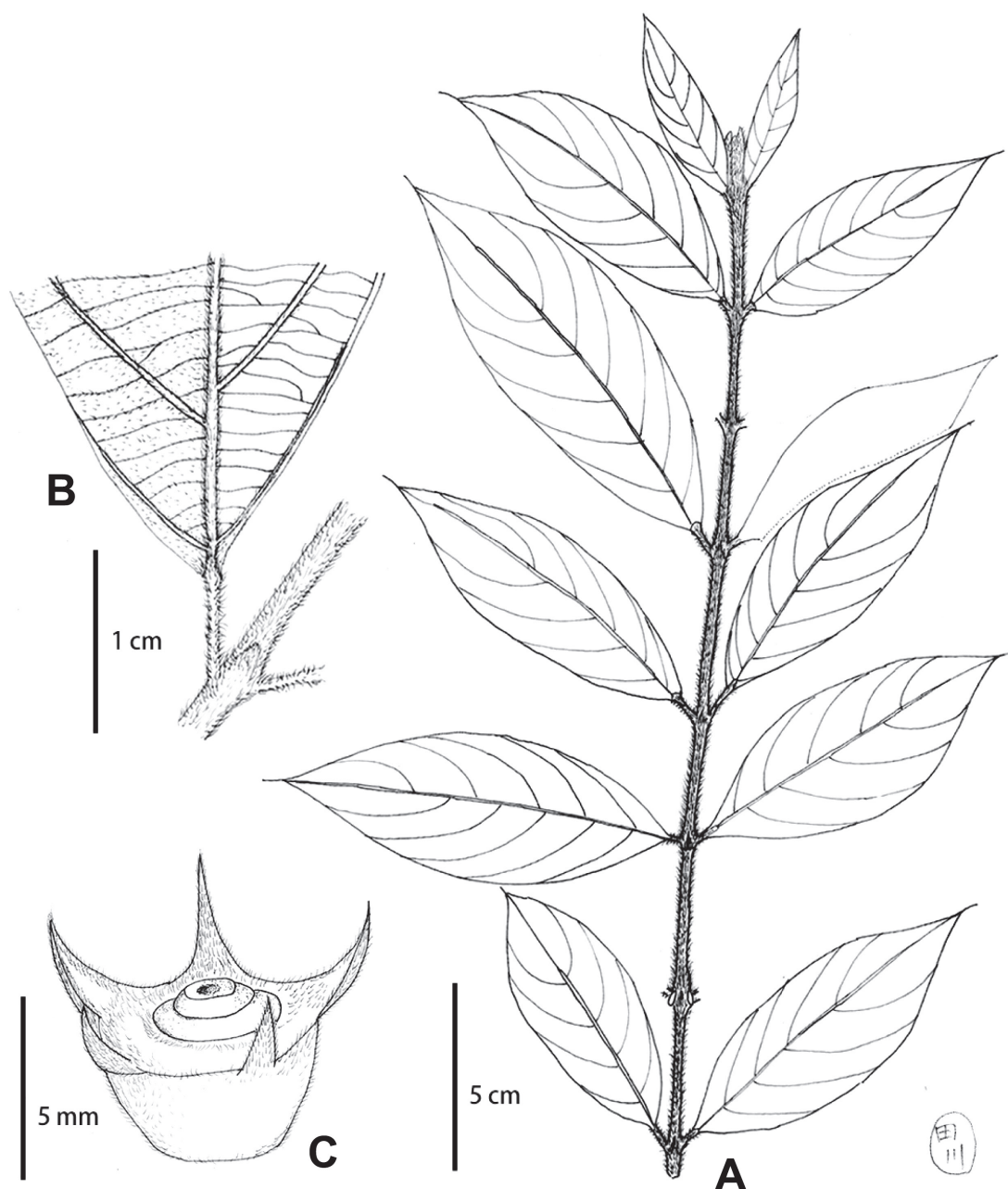


FIG. 14. Line drawing of *Lasianthus stephanocalycinus* Naiki, Tagane & Yahara, sp. nov. (Toyama et al. 3100): A. branch, B. abaxial leaf surface, C. fruit. Drawn by K. Tagawa.

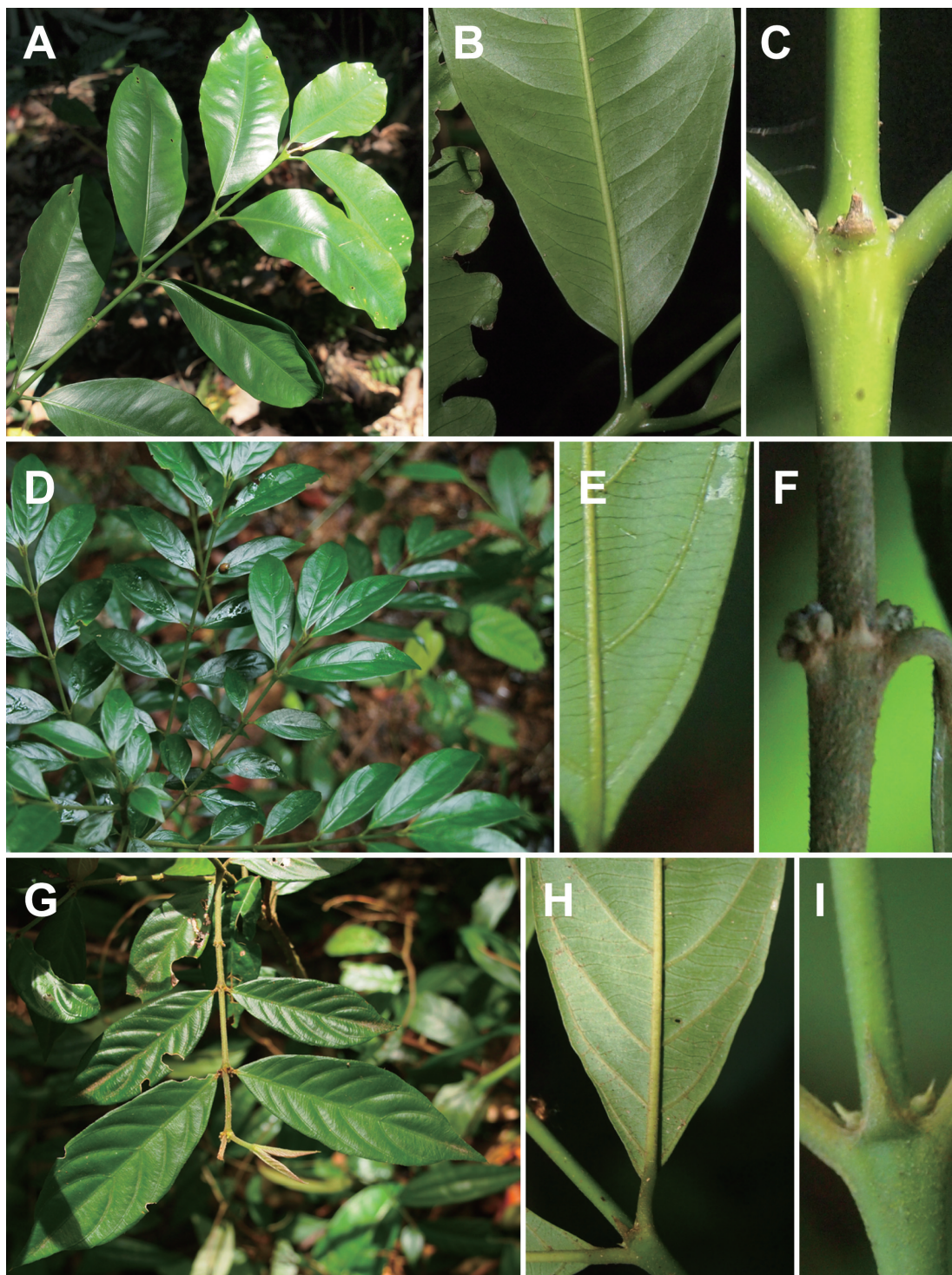


FIG. 15. *Lasianthus viridiramulis* Tagane, nom. nov. (Toyama et al. 6057), A. branch; B. portion of abaxial leaf surface; C. stipule. *Lasianthus* sp. 1 (D & E: Yahara et al. 4524, F: Toyama et al. 2048): D. branches; E. portion of abaxial leaf surface; F. stipule and immature flower buds. *Lasianthus* sp. 2 (Toyama et al. 2372): G. branch; H. portion of abaxial leaf surface; I. stipule.

totaxon. Sin. 39: 148 (2001a).

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 529 m, 10°36'18.59"N, 104°06'03.12"E, 13 Dec. 2011, *Toyama et al.* 2159 (Cam, FU); 602 m, 10°36'44.87"N, 104°06'00.79"E, 8 Dec. 2013, *Toyama et al.* 6057 (BKF, Cam, KYO); 707 m, 10°37'41.02"N, 104°05'37.43"E, 11 Dec. 2011, *Toyama et al.* 2024 (Cam, FU, K); 888 m, 10°37'15.48"N, 104°05'10.71"E, 10 Dec. 2011, *Toyama et al.* 1931 (Cam, FU, P).

*Distribution.* Cambodia (new record), Thailand.

*Note.* *Lasianthus viridiramulis* is conspecific with *L. brevipes* Craib (1933), which was transferred to *Saprosma* Blume by Zhu (2001a). Phylogenetic analyses using chloroplast DNA (*matK* and *rps16* intron) indicated that it is a member of *Lasianthus* (Dang & Toyama, in prep.). *Lasianthus brevipes* Craib (1933) is an illegitimate name because of *L. brevipes* Valetton (1927). *Lasianthus brevipes* Valetton is based on a specimen of a different species from New Guinea. We therefore propose the replacement name *Lasianthus viridiramulis* Tagane.

### 23. *Lasianthus* sp. 1 —Figs. 15D–F.

*Specimens examined.* CAMBODIA. Bokor National Park, alt. 704 m, 10°37'41.02"N, 104°05'37.43"E, 11 Dec. 2011, *Toyama et al.* 2048 (Cam, FU); 760 m, 10°38'02.73"N, 104°05'17.73"E, 24 Oct. 2012, *Yahara et al.* 4524 (Cam, FU).

*Note.* Plants of *Lasianthus* sp. 1 resemble *L. bokorensis*, but differ in having smaller leaves and the midrib of the leaves pubescent near the base (1/3–1/4) adaxially.

### 24. *Lasianthus* sp. 2 —Figs. 15G–I.

*Specimen examined.* CAMBODIA. Bokor National Park, alt. 529 m, 10°36'18.59"N, 104°06'03.12"E, 19 Dec. 2011, *Toyama et al.* 2372 (Cam, FU).

*Note.* *Lasianthus* sp. 2 resembles *L. fordii* and

*L. clementis*, but has hairier twigs and abaxial leaf veins than those two species. The tertiary veins of the leaves are inconspicuous, unlike in *L. clementis*.

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